

# Literal Equations – Worksheet #1



SHOW ALL WORK!!



## Regular Equations

1a)  $x - 7 = 8$   
 $\quad +7 \quad +7$

$$x = 8 + 7 \leftarrow$$

You can combine these!

$$x = 15$$

2a)  $\frac{4x}{4} = \frac{-12}{4}$

$$x = -3$$

3a)  $2x - 5 = 11$

$$\begin{array}{r} +5 \quad +5 \\ \hline 2x = 16 \\ \hline 2 \quad 2 \end{array}$$

$$x = 8$$

4a)  $\frac{1}{2}(4x) = -20$

$$\frac{4x}{2} = \frac{-20}{2}$$

$$x = -10$$

5a)  $\frac{x}{-8} = 11$

$$\cancel{-8} \left( \frac{x}{\cancel{-8}} \right) = 11(-8)$$

$$x = -88$$

## Literal Equations

1b) Solve for x:  $x - b = a$   
 $\quad +b \quad +b$

$$x = a + b \leftarrow$$

You CANNOT combine these

$$x = a + b$$

2b) Solve for k:  $\frac{-3k}{-3} = \frac{m}{-3}$

$$k = -\frac{m}{3}$$

3b) Solve for b:  $2b - 9 = d$

$$\begin{array}{r} +9 \quad +9 \\ \hline 2b = d + 9 \\ \hline 2 \quad 2 \end{array}$$

$$b = \frac{d+9}{2} \text{ or } = \frac{d}{2} + \frac{9}{2}$$

4b) Solve for g:  $aeg = 10$

$$\frac{aeg}{ae} = \frac{10}{ae}$$

$$g = \frac{10}{ae}$$

5b) Solve for y:  $\frac{y}{3} = h$

$$\cancel{3} \left( \frac{y}{\cancel{3}} \right) = h(3)$$

$$y = 3h$$

# Literal Equations – Worksheet #1

6a)  $14 = 2x + 26$

$$\begin{array}{r} -26 \quad -26 \\ \hline \end{array}$$

$$\frac{-12}{2} = \frac{2x}{2}$$

$$\boxed{-6 = x}$$

7a)  $-30 = 4 - 8x$

$$\begin{array}{r} -4 \quad -4 \\ \hline \end{array}$$

$$\frac{-34}{-8} = \frac{-8x}{-8}$$

$$\frac{34}{8} = x$$

$$x = \frac{17}{4}$$

8a)  $3(x - 4) = 12$

$$\begin{array}{r} 3x - 12 = 12 \\ +12 \quad +12 \\ \hline \end{array}$$

$$\frac{3x}{3} = \frac{24}{3}$$

$$\boxed{x = 8}$$

Which of the following is equivalent to:

$$7a - 8b = 10x$$

A.  $a = \frac{18xb}{7}$

**B.  $a = \frac{10x+8b}{7}$**

C.  $a = \frac{10x-8b}{7}$

6b) Solve for v:  $3d = 7v + 5$

$$\begin{array}{r} -5 \quad -5 \\ \hline \end{array}$$

$$\frac{3d-5}{7} = \frac{7v}{7}$$

$$\boxed{\frac{3d-5}{7} = v = \frac{3d}{7} - \frac{5}{7}}$$

7b) Solve for h:  $7a = 10 - 2h$

$$\begin{array}{r} -10 \quad -10 \\ \hline \end{array}$$

$$\frac{7a-10}{-2} = \frac{-2h}{-2}$$

$$\boxed{\frac{-(7a-10)}{2} = h = -\frac{7a}{2} + 5}$$

8b) Solve for p:  $5(4x + p) = w$

$$20x + 5p = w$$

$$\begin{array}{r} -20x \quad -20x \\ \hline \end{array}$$

$$\frac{5p}{5} = \frac{w-20x}{5}$$

$$\boxed{p = \frac{w-20x}{5} = \frac{w}{5} - 4x}$$

Which of the following is equivalent to:

$$4ab + k = 13$$

A.  $k = \frac{13}{4ab}$

B.  $k = \frac{13-ab}{4}$

**C.  $k = 13 - 4ab$**

# Literal Equations – Worksheet #2

5) Solve for  $b$ :  $A = \frac{1}{2}bh$  (Area of a triangle)

$$(2) A = \cancel{\frac{1}{2}} bh \quad (2)$$

$$\underline{2A} = \underline{bh}$$

$$\boxed{\frac{2A}{b} = h}$$

6) Solve for  $r$ :  $C = 2\pi r$  (Circumference of a circle)

$$\frac{C}{2\pi} = \frac{2\pi r}{2\pi}$$

$$\frac{C}{2\pi} = r$$

7) Solve for  $w$ :  $P = 2L + 2w$  (Perimeter of a rectangle)

$$- P = 2L + 2w$$

$$- 2L - 2L$$

$$\frac{P - 2L}{2} = \frac{2w}{2}$$

$$\boxed{w = \frac{P - 2L}{2}}$$

$$w = \frac{1}{2}P - L$$

8) Solve for  $t$ :  $D = rt$  (Linear motion)

$$\frac{D}{r} = \frac{rt}{r}$$

$$\frac{D}{r} = t$$

9) Solve for  $C$ :  $F = \frac{9}{5}C + 32$  (Temperature conversions)

$$F = \frac{9}{5}C + 32$$

$$- 32 \quad - 32$$

$$\frac{5}{5} (F - 32) = \frac{9}{5}C \left( \frac{5}{9} \right)$$

$$\frac{5}{9} (F - 32) = C$$

# Literal Equations – Worksheet #2



SHOW ALL WORK!!



## Regular Equations

1a)  $43 - 2x = 11$

2a)  $23 + 4x - 34 = -11$

3a)  $3(2x - 7) = 6$

$$\begin{aligned} 6x - 21 &= 6 \\ +21 \quad +21 & \\ \hline 6x &= 27 \\ \frac{6x}{6} &= \frac{27}{6} \\ x &= \frac{27}{6} = \frac{9}{2} \end{aligned}$$

## Literal Equations

1b) Solve for  $\underline{x}$ :  $3y + 2x = -1$

$$\begin{aligned} -3y \quad -3y \\ \hline 2x &= \frac{-1-3y}{2} \\ \hline x &= \frac{-1-3y}{2} \\ x &= -\frac{1}{2} - \frac{3}{2}y \end{aligned}$$

2b) Solve for  $\underline{k}$ :  $3 - 3k + 7k = 5b$

$$\begin{aligned} 3 + 4k &= 5b \\ -3 \quad -3 \\ \hline 4k &= 5b - 3 \\ \frac{4k}{4} &= \frac{5b-3}{4} \end{aligned}$$

3b) Solve for  $\underline{b}$ :  $\frac{1}{2}(4a + 10b) = c$

$$\begin{aligned} 2a + 5b &= c \\ -2a \quad -2a \\ \hline 5b &= c - 2a \\ \hline b &= \frac{c-2a}{5} \\ b &= \frac{1}{5}c - \frac{2}{5}a \end{aligned}$$

Formulas can be manipulated through the process of solving literal equations.

4) Solve for  $\underline{h}$ :  $A = bh$  (area of a parallelogram)

$$\begin{aligned} A &= bh \\ \frac{A}{b} &= h \end{aligned}$$

# Literal Equations – Worksheet #3



SHOW ALL WORK!!



Formulas can be manipulated through the process of solving literal equations.

- 1) Solve for b:  $A = bh$  (Area of a parallelogram)

$$\frac{A}{h} = \frac{bh}{h}$$

$$\frac{A}{h} = b$$

- 2) Solve for h:  $A = \frac{1}{2}bh$  (Area of a triangle)

$$(2) A = \frac{1}{2}bh \quad | \cdot 2$$

$$\frac{2A}{h} = \frac{bh}{h}$$

$$b = \frac{2A}{h}$$

- 3) Solve for d:  $C = \pi d$  (Circumference of a circle)

$$\frac{C}{\pi} = \frac{\pi d}{\pi}$$

$$\frac{C}{\pi} = d$$

- 4) Solve for L:  $P = 2L + 2W$  (Perimeter of a rectangle)

$$\begin{array}{r} P = 2L + 2W \\ -2W \quad -2W \hline \end{array}$$

$$L = \frac{P - 2W}{2}$$

$$\frac{P - 2W}{2} = \frac{2L}{2}$$

$$L = \frac{1}{2}P - W$$

- 5) Solve for t:  $D = rt$  (Linear motion)

$$\frac{D}{r} = \frac{rt}{r}$$

$$t = \frac{D}{r}$$

# Literal Equations – Worksheet #3

Solve each of the following equations for the variable "y".

$$6) \quad \frac{2y}{2} = \frac{4x}{2} + \frac{10}{2}$$

$$y = 2x + 5$$

$$9) \quad \frac{-5y}{-5} + \frac{15}{-5} = \frac{3x}{-5}$$

$$-5y = 3x - 15$$

$$y = -\frac{3}{5}x + 3$$

$$7) \quad \frac{2x}{-2x} + \frac{4y}{-2x} = \frac{-22}{-2x}$$

$$\frac{4y}{4} = \frac{-2x}{4} - \frac{22}{4}$$

$$y = -\frac{1}{2}x - \frac{11}{2}$$

$$10) \quad 18 = 3y - 12x$$

$$+12x \quad +12x$$

$$\frac{12x + 18}{3} = \frac{3y}{3}$$

$$4x + 6 = y$$

$$8) \quad 8y - 4x = 2$$

$$\frac{8y}{8} = \frac{4x + 2}{8}$$

$$y = \frac{1}{2}x + \frac{1}{4}$$

$$11) \quad 19 = 7x + y$$

$$-7x \quad -7x$$

$$19 - 7x = y$$

or

$$-7x + 19 = y$$